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**United States Patent** [19]**Kamiyama**[11] **Patent Number:** **5,694,937**[45] **Date of Patent:** **Dec. 9, 1997****[54] ULTRASOUND DIAGNOSTIC APPARATUS AND METHOD**[75] **Inventor:** Naohisa Kamiyama, Otawara, Japan[73] **Assignee:** Kabushiki Kaisha Toshiba, Kawasaki, Japan[21] **Appl. No.:** 593,886[22] **Filed:** Jan. 30, 1996**[30] Foreign Application Priority Data**

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[51] **Int. Cl.<sup>6</sup>** ..... A61B 8/00[52] **U.S. Cl.** ..... 128/661.01; 128/662.02[58] **Field of Search** ..... 128/662.02, 660.05, 128/661.01**[56] References Cited****U.S. PATENT DOCUMENTS**

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According to an ultrasound diagnostic apparatus of the present invention, a cross section of an examining human body having bubbles implanted as ultrasonic shadowing agent is scanned by an ultrasound so as to obtain an echo signal. Image data is repeatedly generated based on the echo signal. Then, image data is displayed as a motion image. Power of the ultrasound to be transmitted is changed from first power to second power, which is stronger than first power. The ultrasound of first power breaks a first amount of bubbles. The ultrasound of second power, which is stronger than first power, breaks a second amount of bubbles, which is larger than the first amount of bubbles. Though the image generated by use of first power is unclear, the amount of breakage of bubbles can be extremely retrained. Since the image is used to examine the state of the bubble flow to the region of interest, unclearness can be allowed. When the bubbles are fully introduced to the region of interest, first power is changed to second power. Second power is stronger than first power. Therefore, the image obtained by second power is clearer than image obtained by first power, and is fit for a high accurate diagnosis of the state of the blood stream.

**28 Claims, 10 Drawing Sheets**